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*Back.**Maritimus*.—Olive, margined by bluish gray.*Peninsulæ*.—Dull black, margined by greenish olive.*Macgillivraii*.—Deep black, bordered by greenish olive and margined with bluish gray.*Fisherii*.—Deep black, bordered by mummy brown and margined by bluish gray.*Breast.**Maritimus*.—Streaked with bluish gray, margined with buff.*Peninsulæ*.—Streaked with dusky, margined with buff or bluish gray.¹*Macgillivraii*.—Streaked with dusky, margined with buff.*Fisherii*.—Streaked with black, widely margined with pale ochraceous.*Flanks.**Maritimus*.—Obscurely streaked with bluish gray and faintly washed with buff.*Peninsulæ*.—Streaked with dusky, margined with grayish or olive buff.*Macgillivraii*.—Streaked with dusky, margined with buff.*Fisherii*.—Streaked with black, widely margined with pale ochraceous.*Average measurements.*

		Wing.	Tail.	Bill from nostril.
<i>Maritimus</i>	· · ·	2.52	2.25	46.5 in.
<i>Peninsulæ</i>	· · ·	2.32	2.09	42 " "
<i>Macgillivraii</i>	· · ·	2.36	2.18	46 "
<i>Fisherii</i>	· · ·	2.29	2.12	45.8 "

A CHAPTER IN THE LIFE OF THE CANADA JAY.

BY OSCAR BIRD WARREN.

ON THE 22d of February of this year (1898), while returning from a walk to a lumber camp near Mahoning, Mich., I discovered a pair of Canada Jays (*Perisoreus canadensis*) building a nest.

¹ Eight of sixteen specimens have the breast more or less washed with buff.

Though on the lookout for the nest of the 'Meat Hawk' ever since its acquaintance was first formed, never before had it by any sign or action revealed its nesting place to me. Many a long walk through almost impenetrable spruce swamps, floundering in several feet of soft snow too light for snowshoeing, had been unrewarded. These birds had often been abundant around the lumber camps and in company with the Blue Jay, were common about the houses during the fall and winter months; but their breeding habits remained a secret. Therefore this discovery coming so unexpectedly after many fruitless searches was all the more joyfully received.

I was walking down the Wright-Davis railroad through a spruce swamp at the time, and had come to a place known as the 'Sink,' where a few years ago a large stretch of roadbed had suddenly disappeared in the seemingly bottomless 'Muskey' swamp, and where the track is now laid on a mass of pine and tamarac logs, the only means of support; when my attention was attracted by a flock of noisy Chickadees chasing through the trees. Looking up, what should I see but a pair of Canada Jays pulling beard moss and spider nests from some dead trees and making short trips to a neighboring live spruce about 150 feet from the railroad track, where they were evidently building a nest.

Taking a short circuit I reached a position where I could watch their movements better without attracting attention. They brought small sticks, beard moss, spider nests and strips of bark from the trees and sphagnum moss from about the base of the trees where not covered with snow, and deposited all of this in a bunch of branches at the end of a limb,—a peculiar reversed umbrella-shaped formation commonly seen in the small spruce trees, probably caused by some diseased condition of growth. The female arranged the material, pressing it into the proper shape and weaving it about the small twigs to form a safe support. Though the birds obtained the material so near, where it was abundant, yet they carefully picked up any which accidentally fell from the nest, and there were no signs of sticks or any fragments of nesting material at any time during the construction of the nest.

My first observation was short, owing to the cold weather. A

sharp wind was blowing, accompanied by a light fall of snow, and the temperature was hovering near the zero mark. Returning in a few days, I found the birds still adding to their nest and working in a manner which meant business. From this time on my visits were as frequent as opportunity permitted.

After the bulk of the nest was built the work went on more leisurely, very little being accomplished on stormy days. The birds were away feeding at the lumber camps in the morning until about 10 o'clock and went back soon after 4 P. M. They also gathered grubs from the floating logs at the 'Sink,' and I have often seen them chasing a Woodpecker away from the trees just when he had uncovered the worm he had worked so hard to dig out.

The notes of the Canada Jay are varied and pleasing, and they are as hard to identify as those of his cousin, the Blue Jay. On pleasant days the male trilled from a spruce top a song of sweetly modulated notes wholly new to my ears. He always sang in *sotto voce*, and it required an acquaintance with the songster to realize that he, though so near, was the origin of those notes which seemed to come from somewhere up in the towering pines which surrounded this strip of swamp, so lost was the melody in the whispering, murmuring voices of the pines.

By the 3d of March the nest was well formed and smoothly lined with fine grass and thin strips of bark. On the 12th it was completed, being beautifully and warmly lined with feathers picked up in the forest and representing several species of birds. Those of the Ruffed and Canada Grouse were in greatest evidence, a feather of the latter being stuck in the edge of the nest where it showed quite conspicuously. These birds had spent nearly a month building their nest, and as a result the finished abode was perfectly constructed. It was large and substantial and yet not bulky, being a model of neatness and symmetry. The bulk of the nest was composed of strips of bark, small sticks, an abundance of dry sphagnum moss, some beard moss and grass, the whole being fastened securely together by small bunches of spider nests and cocoons. The first lining was made of thin strips of bark and fine grass, and this received a heavy coating of feathers, making a nest so warm that a temperature far below

the zero mark would have no effect on the eggs it was to receive, as long as the mother brooded over them. The small twigs growing from the cluster of branches in which the nest was built gave it a rough appearance from below, but they served the purpose of secure supports and as a screen for concealment. As there were dozens of similar masses of limbs in the trees all about, a good observer might pass underneath this tree a score of times, and never see the nest, though but a few feet above his head.

The four eggs were laid between the 14th and 18th inclusive, and incubation fairly started on the 19th. The measurements, carefully taken, were as follows: $.83 \times 1.18$, 82×1.16 , $.84 \times 1.16$, and $.83 \times 1.17$. They were placed with the small ends all pointing in and made a pretty sight on a background of feathers of various colors. The eggs were very uniform in color, having a ground of greenish gray when fresh, the whole finely dotted and spotted with slate and brown with obscure blotches of light lavender. The bulk of the markings were grouped about the large end, forming a distinct circle of larger markings than on the balance of the egg, the lavender being more obscure and tending to run together.

From the time the nest was first discovered plans were being formulated to obtain the most good from my rare fortune. When I climbed the slender swaying tree and looked at the completed set of beautiful eggs in the deep feather lined pouch whose edges nearly met striving to protect the treasures from the frigid weather and yet colder human avarice, I will confess the evil spirit possessed me for a moment and I longed to secure these gems for my hoard, yet better judgment soon dispelled these evil thoughts. Pity for the poor birds who had begun to trust me, and a desire to allow Nature to further reveal her hidden secrets to me, overcame the narrow cravings of the egg hunter and opened the way to experiences never to be told in any language I can hope to command. Were it not that my camera caught these pictures, the scenes would have remained undescribed.

The circumference of the tree in which the nest was placed, $11\frac{3}{4}$ ft. from the base, a point just opposite the nest, was nine inches, and but four inches five feet above this point. Less than three feet from this tree was a dead spruce, slightly smaller, on

which I nailed a few cleats to assist in climbing and as resting places while watching the birds feed their young. I fastened these trees together with heavy twine to give them mutual support. Seven feet from the nesting tree was a larger spruce which I fitted up as an observatory and camera stand and from which all my successful exposures were made.

The first picture (Fig. 1) was taken on the morning of March 25, after incubation had advanced at least six days; and the mother bird had begun to sit quite closely. The front of the camera was a little over five feet from the nest and I stood just behind the camera barely seven feet from the bird. It required the greatest amount of patience to secure this picture as the day, though fairly clear, was windy and cloudy at times. The bird seemed to leave the nest just when the light was most favorable, returning to warm the eggs, then away again for a moment, until I almost despaired of obtaining a good picture; but finally a short timed exposure was made under favorable conditions. Having a picture of the nest I next attempted to photograph the nest and eggs *in situ*, but I was unable to, as I had no means of fastening my camera in so slender a tree in a position to secure a properly focused picture, without rigging up an elaborate stand, which would have attracted the attention of passersby and resulted in the destruction of the nest. In my efforts to secure this picture I had nearly demolished the beautiful canopy which protected the nest from above and which it was necessary to remove in order to get a clear view of the nest and contents. I had also caused the poor birds much discomfort. The female was always on the nest when I came but left as soon as I had climbed the tree, uttering a loud clear alarm note, which soon brought the male soaring from over the trees to her side. Never did either give voice to a harsh, scolding note, but showed their excitement by hopping restlessly about in the tree just out of reach, raising and lowering the feathers of the head, twitching their tails and uttering in low tones several notes, among which were some which could be expressed by the syllables *koke*, *koke-ke-keer*, *keer*, *keer*. *Koke-ke-keer* (uttered quickly) is a favorite cry of this bird, and when given loudly can be heard very plainly for over a quarter of a mile.



FIG. 3. CANADA JAY FEEDING YOUNG.



FIG. 4. CANADA JAY CLEANING NEST.



FIG. 1. CANADA JAY AND NEST



FIG. 2. CANADA JAYS FEEDING YOUNG.

The mother bird often tried to enter the nest, but was unable to, as I kept the eggs warmly covered while trying to get my camera into position. The expression of anxiety in her dark eyes will never be forgotten, nor could I longer endure the sight of discomfort I was giving these helpless creatures. Repairing what damage I had done as well as I was able, I gave up this part of my plans and waited with great eagerness for the appearance of the young birds. The last egg was hatched at 5 P. M. April 4, and fortunately being on hand to assist in freeing the bird from the shell, I pocketed the two pieces and afterwards rudely fastened them together. Before descending, I noticed that there were but three young birds in the nest, the other having fallen from the nest, perhaps when the mother bird had hurriedly flown away. I found the naked youngster in the ice and snow at the foot of the tree; tenderly picking it up, it was replaced with its fellows and was alive and seemingly well on my visit two days later. The period of incubation had been between seventeen and eighteen days.

After the young were a few days old the camera was again brought into play and two negatives taken. These were made from a point further up in the tree and looking down into the nest, which gave it a flattened appearance. In the first picture the hardy young birds were dozing in the sunshine, while the mother bird watched my movements, half suspiciously, and finally left the nest after the exposure was made, returning from the opposite side, where she was joined by the male who had come with food for the nestlings. I made a snap shot (Fig. 2) when the sun was slightly obscured by a cloud, as I wished to get the two birds feeding the young together, and chances were few. On the 15th four more exposures were made, but at this time I had fastened the camera on a projecting support at a point a little higher than the nest and so close that the front was scarcely four feet from the birds. The results were much better on account of the increase in size. The weather at this time in the spring was so unfavorable that no more pictures could be taken; otherwise a few very interesting scenes could have been added.

The food given to the young was always in a soft, partially digested state, and was placed deep in the mouths of the young

by the old birds. I often watched them feeding the young when my eyes were not three feet from the birds, thus giving a chance for the closest possible observation (Fig. 3). I have held my hand on the side of the nest while the mother unconcernedly fed her babies, but I was never able to take as great liberties with the male.

During the first few days after the nestlings were born, the male brought most of the food, the female remaining at the nest and, when the male returned, assisting in giving the food to the young by putting her bill into their mouths and forcing down any troublesome morsels. As the birds grew older the female took a more active part in carrying the food. I have timed them during the feeding hours and found that they came and went about every fifteen minutes with great regularity until the young were satisfied. When the male had discharged his burden he left immediately without waiting for the return of the female, but the mother always staid until the male had returned or was in sight. The male was never seen on the nest during the period of incubation, nor afterwards, and as his color is much darker than the female's there was never any trouble in distinguishing between them, even at a distance.

The female cleaned the nest often and very carefully, keeping it perfectly free from any filth. It seems this was done both for cleanliness and for the purpose of keeping the nest dry and warm. A picture was taken of this nest cleaning operation but was unfortunately light struck (Fig. 4). It shows the four young to good advantage as they were all pushed up to the edge of the nest to allow the mother plenty of room for her work. The male always picked up any droppings which were cast over the nest and had clung to the branches, carrying all away almost every time he left the nest. By this constant care no trace of the presence of the nest was allowed at any time. It should also be added here that the young never made any noise excepting a weak chirp while with open mouths they waited their turn to be fed.

When the nestlings had their hunger appeased they took a nap, either seeking a covering under their mother's wing or basking in the sunshine. The mother finally became so accus-

omed to my company that she also dozed perfectly at ease. The reason for this trustfulness was perhaps the natural quiet temperament of the bird, added to which was my good deportment, I being always careful to avoid frightening her by any sudden noise or movement, and I had never handled the eggs except when the measurements were taken, nor had ever touched the young birds except to save the life of the newly born infant as before referred to.

It had been my intention to secure a pair of the young when they were about large enough to leave the nest, and rear them in captivity. There was quite a heavy fall of snow on the 18th and 19th, and thinking the young would not leave the nest until the weather was pleasanter, I neglected visiting the nest until the afternoon of the 20th, and then found the side of the nest roughly torn out, by what agency I know not. The old birds were flying about and I soon found a youngster lying on the ground in the frozen mass. Picking it up I discovered that, though perfectly feathered, it was a cripple, having a twisted neck. It then occurred to me that this bird must have been the one which fell from the nest on April 4th and though in perfect condition, according to appearances, while in the nest, it was now in a helpless state. Not being able to raise this deformed bird it was killed and sent to Dr. T. S. Roberts of Minneapolis who made an examination of it and described its injury as follows: "The deformity of which you speak seemed to consist in the stiffening or partial ankylosis of the middle third of the neck. The injury sustained must have caused an inflammation between the bones of that part of the neck, this resulting in their being more or less firmly united by adhesion. Other than this no injury was detected."

Thus ended a most interesting and instructive acquaintance with this family of Jays. Though my plans had not been wholly accomplished yet I felt very thankful to Nature for her kindness in showing me one of her closest kept secrets and await an opportunity to renew my acquaintance with *Perisoreus canadensis*.